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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,524	10/16/2001	Ramin Emami	AMAT/6092/CALB/ECD/PJS	7676

32588 7590 11/18/2002

APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

PHAM, LONG

ART UNIT PAPER NUMBER

2814

DATE MAILED: 11/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,524

Applicant(s)

EMAMI, RAMIN

Examiner

Long Pham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-13 in Paper No. 3 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "may be" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 3, 4, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) of this application in view of Adams et al. (US '155) and Lee et al. (US '552).

AAPA teaches a method for preventing corrosion of a substrate surface in an edge bead removal process, comprising (see figures of 1A-1B and the Background of the Related Art of this application, pages 2-5) rinsing the substrate surface with a rinsing solution containing rinsing agent of deionized water prior to removing the edge bead.

However, AAPA fails to teach that the rinsing solution further includes benzotriazol or toluenetriazol as recited in present claims 1, 4, and 5.

Adams et al. teach that plated metal is rinsed in a solution comprising deionized water and benzotriazol. See col. 8, line 65 to col. 9, line 10.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to include benzotriazol in the rinsing solution in the method of AAPA because in doing so a protective layer is formed on the metal. See col. 9, lines 5-10.

AAPA in view of Adams fails to teach range for the concentration of benzotriazol in the rinsing solution as recited in present claims 2 and 3.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal range for the concentration of benzotriazol in the rinsing solution through routine experimentation and optimization to obtain optimal or desired device performance because the concentration of benzotriazol in the rinsing solution is a result-effective variable and there is no evidence indicating that the concentration of benzotriazol in the rinsing solution is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA further fails to teach spin drying the substrate surface with an isopropyl alcohol as recited in present claim 6.

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Lee et al. teaches a cleaning process in which the substrate surface is spin dried using isopropyl alcohol after rinsing. See col. 6, lines 35-45.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to spin dry the substrate surface using isopropyl alcohol after rinsing in the method of AAPA because in doing so the unwanted deionized water remaining is removed. See col. 6, lines 43-45.

6. Claims 7, 8, 9, 10, 11, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) of this application in view of Dordi et al. (US '853) and Adams et al. (US '155).

AAPA teaches a method for removing an edge bead from a substrate surface, comprising (see figures of 1A-1B and the Background of the Related Art of this application, pages 2-5):

rinsing the substrate surface to remove residue chemicals therefrom; and applying an edge bead removal solution to the substrate surface.

AAPA fails to teach subjecting substrate surface to spin rinse dry process using benzotriazol after the application of the edge bead removal solution as recited in present claim 7.

Dordi et al. teach that substrate surface is subjected to spin rinse dry process after the excess metal is removed or edge bead removal. See the abstract.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to subject the substrate surface after the edge bead removal in the method of AAPA because in doing so flexible architecture is achieved. See the abstract.

Dordi et al. fails to teach that the spin rinse dry process is done in presence of benzotriazol and deionized water as recited in present claims 7, 8, 9, and 12.

Adams et al. teach that plated metal is rinsed in a solution comprising deionized water and benzotriazol. See col. 8, line 65 to col. 9, line 10.

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It would have been obvious to one of ordinary skill in the art of making semiconductor devices to subject the substrate surface to spin rinse drying process in the presence of benzotriazol and deionized water because in doing so a protective layer is formed on the metal. See col. 9, lines 5-10.

AAPA in view of Adams et al. fails to teach range for the concentration of benzotriazol in the rinsing solution as recited in present claims 10 and 11.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal range for the concentration of benzotriazol in the rinsing solution through routine experimentation and optimization to obtain optimal or desired device performance because the concentration of benzotriazol in the rinsing solution is a result-effective variable and there is no evidence indicating that the concentration of benzotriazol in the rinsing solution is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA in view of Dordi et al. and Adams et al. fails to teach removing the protective barrier with an etchant as recited in present claim 13.

However, the omission of an element and its function is obvious if the function of the element is not desired. See *Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989), *in re Larson*, 340 F.2d 965, 144 USPQ 347 (CCPA 1965), and *in re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

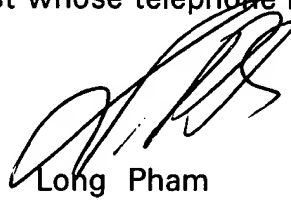
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 703-308-1092. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-4082 for regular communications and 703-746-4082 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Long Pham

Primary Examiner

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L. P.

November 12, 2002